User Manual

Last Update: August 3rd, 2009

Thank you for choosing Agility In Motion Wi-Chrono.

The Wi-Chrono wireless timer system was designed for ease of use and portability while preserving a rich feature set.

The system consists of:

- 1 or more **Station Set**. Each set is composed by one **Beam Emitter** and one **Receiver**. The **Emitter** is responsible for sending a beam of infrared waves to the receiver. The infrared light is invisible to human eye, and harmless to animals and persons, it uses the same technology as TV remote controls.

  The **Receiver** is equipped with a beam waves sensor and detects any interruption in the path of light, sending a wireless notification to the **Base** unit. This notification will be interpreted as an indication that an object has crossed the infrared link between the **Emitter** and the **Receiver.**

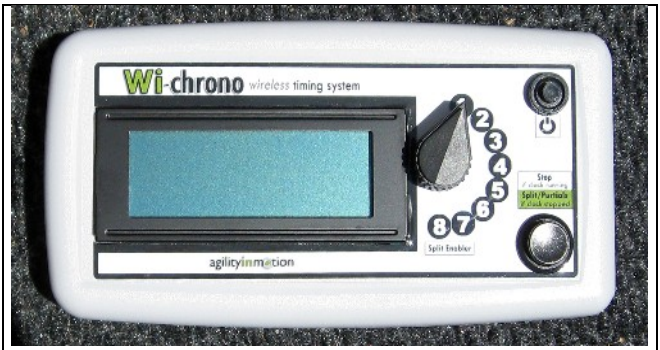
  *No configuration of any kind is required for operation of the **beam emitter and receiver set.***

- A **Base** unit that is responsible for displaying the elapsed time and interpreting the signals sent by the Station Sets. The base unit acts as console for the system, providing partial times, and allowing to interchange between partial times and accumulated times.

  *The only configuration input to the **base** unit is a knob to adjust how many partial times you want to account for.*

1 Packing list

- Base unit:



Pict. 1: Base Unit

- Station Set. The set is composed by 2 small boxes, one is the receiver and one is the emitter. Depending on the configuration of the equipment you acquired, you may have more than 1 set, the system supports up to 8 sets. Receiver and Emitter boxes are equipped with their respective Elastic Velcro tie.

Pict. 2: Receiver

Pict. 3: Beam Emitter

2 Installing the stations

Install each Receiver and Emitter set with their back flat against their mounted equipment and the arrows in the graphics pointing at each other.

The height depends on how high your dog jumps over the bars, but as a general rule, the set may be installed about 10 inches over the bar (or 25 cm).

Both the receiver and the emitter are equipped with Velcro® tape and Elastic Velcro tie for easy installation on virtually any surface or equipment.

2.1 Installing on a jump stand

Unwrap the Velcro tie and wrap it around the jump stand at the proper height. *Install the receiver and emitter boxes with their back flat against the stands for stability.*

2.2 Installing the station set on a flat surface

Apply a small piece of adhesive Velcro to your equipment at the desired height. Take away the elastic Velcro tie from the receiver and emitter and apply a small piece of adhesive Velcro on the back of the receiver box. Press the back of the receiver box against the Velcro applied on the equipment. Do the same with the emitter.

2.3 Other ideas

You may build your own set of PVC stands that will allow you to easily slide the station boxes up and down a for quick change of heights. Remember to *install the receiver and emitter with their back flat against the stands for stability.* Or you may use magnets with Velcro to attach the set to metallic jumps. Or you may use tripods.

3 Proper Alignment of the Station Set

Install each Receiver and Emitter set with graphic arrows pointing at each other. Their back should be flat against the mounted equipment and the front of the set should be visible.

Turn on the set by pressing the On/Off switch. You will know the set is properly aligned when the Alignment Indicator LED on the Receiver turns on.

The height at which to install the set depends on how high your dog jumps over the bars, but as a general rule, the set may be installed about 10 inches over the bar (25 cm).

If you are using 2 or more sets at the same time, make sure to point the emitters across from each other so the beam of infrared light of one set is only sensed by its receiver and not detected by the other stations too.

4 Beam Emitter

4.1 LEDs and IR (Infrared) transmitter

The clear light on the left side of the box is the infrared LED emitter. The green LED on the front of the box is the On/Off indicator. The red LED is the Low Battery indicator.

The infrared LED emitter is a very low power device and completely harmless for dogs and humans. It uses the same technology as a regular TV remote control.

5 Receiver

5.1 LEDs and IR reception sensor

The orifice on the right side of the box allows the reception of the infrared light emitted by the beamer while insulating the sensor from direct sunlight exposure.

The green LED on the front of the box is the On/Off indicator. The red LED is the Low Battery indicator.

The LED closest to the orifice, the yellow LED in this picture, is the Alignment indicator. This LED turns on and stays on as long as the infrared signal sent from the Beam Emitter is received.

5.2 LED status description

When the “Power Switch” in the “Off” position, you would observe that no LEDs are lit.

Fig. 1: Power switch and On/Off LED Indicator

When you turn the device on, and provided that the batteries are installed and charged, you will observe one of the following:

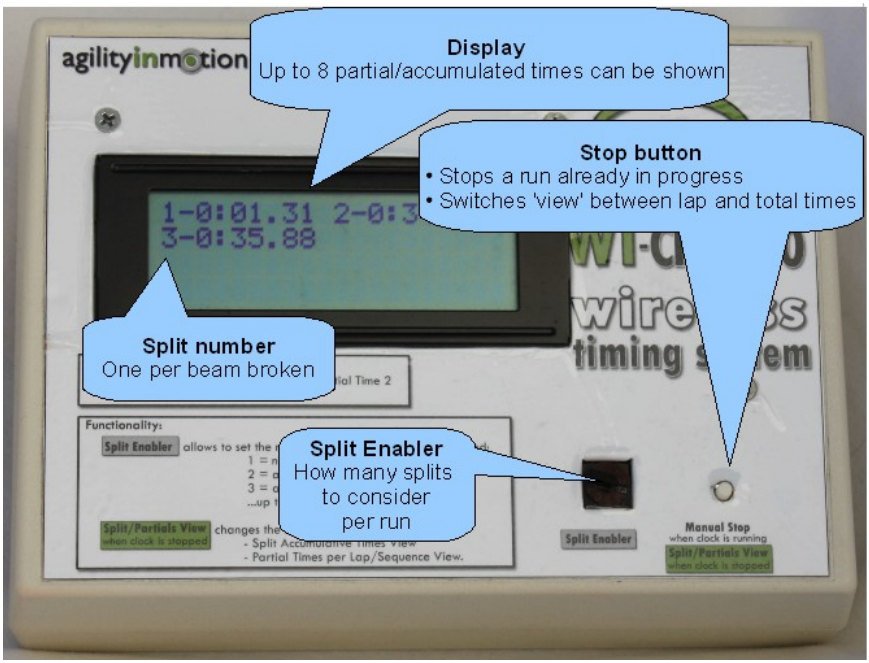
Fig. 2: a) Unit is ON – Alignment LED is OFF, indicates that the receiver is not able to "see" the Emitter

Pict. 3: Receiver & Beam Emitter are aligned. The Alignment LED is ON.

Fig. 3: Red LED lit indicates the batteries are low and need to be replaced. The system may not work properly with low batteries power.

6 Base Unit

The “Base Unit” is the brain of the system, it processes the signals sent by the “Receiver” every time the an object breaks the beam transmitted by the “Beam Emitter”.



Pict. 4: Base Unit - Main components

The Base Unit has only 1 configuration component, the “Split Enabler” which tells the system how many splits are in a single run, in order to stop the clock.
The “Manual Stop” button allows to manually stop a run once started, or changes the “Display” between partial times and total accumulated times.

6.1 Choosing a value for “Split Enabler”

Pict. 5: Split Enabler set to 3

The “Split Enabler” tells the system how many segments, or partial times, are required to stop the clock.

The stopwatch is always activated by the first beam that is interrupted, then it will stop depending on the configuration of the “Split Enabler”

Please refer to the following table for details on how the configuration of the “Split Enabler” affects the number of split times that will be considered by the system.

Split Enabler configuration	Number of "Beams" required to stop the clock ***after*** clock started	***Total*** "Beams" crossed to stop the clock
1	1	2
2	2	3
3	3	4
4	4	5
5	5	6
6	6	7
7	7	8
8	8	9

Pict. 6: Effect of "Split Enabler" on number of splits to consider

As an example, assume that the “Split Enabler” is set to 3, as it is depicted in “Pict. 5', the following events will occur:

- The first beam is crossed and the clock is started
- Next beam is crossed 3.89” later, and the accumulated time is stored for split #1
- Next beam is crossed, and the accumulated time is stored for split #2 (for example, if the time between crossing the 1st beam and the 3rd beam is 8.13”, then the accumulated time for split 2, will be 8.13
- Next a beam is crossed at time 13.85”, and being the 3rd beam crossed after the clock started, the stopwatch is stopped

6.2 Changing the view between “partial” and “total” times

After a run is completed, either by crossing beams enough times or by pressing “Manual Stop”, you can switch between “partial” and total times view.

In “total” times view, the times are expressed as the accumulated times since the start of the run, whereas in “partial” times view, the times are expressed as the difference with respect to the previous lap.

For example, given the same run as in “6.1 Choosing value for Split Enabler”, which we refresh here :

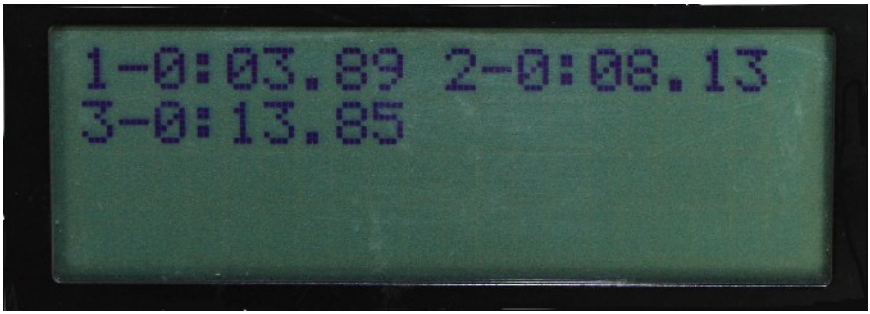


Fig. 4: A run with 3 splits - Accumulated Times view

When switching to “Partial Times” view, you'd see :

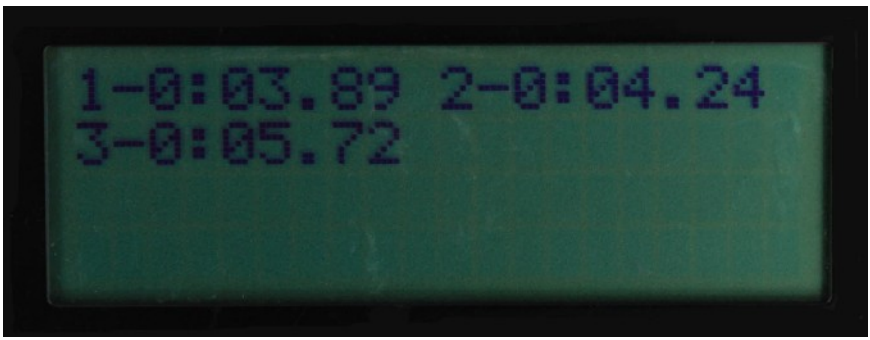


Fig. 5: A run with 3 splits - Partial Times view

You can switch views as many times as you wish.

7 Troubleshooting and common symptoms

For all components of the system, the “Beam Emitter”, the “Start-Split-Stop” or the “Base Unit” the main reason for malfunction is low battery. Please contact us at **info@agilityinmotion.com** if you have questions.

7.1 “Beam Emitter”

Symptom: The “power” LED is not on

Possible reasons and suggested actions:

- The batteries are drained, try replacing the batteries
- The batteries polarity is reversed, follow the drawings in the battery holder

7.2 “Start-Split-Stop”

Symptom: The “power” LED is not on

Possible reasons and suggested actions:

- The batteries are drained, try replacing the batteries
- The batteries polarity is reversed, follow the drawings in the battery holder

Symptom: The “Start-Split-Stop” is unable to 'see' the beam from the “Beam Emitter”

Possible reasons and suggested actions:

- If no “Link Quality” LED is ON, then the units might be seriously misaligned, try realigning them
- If the alignment is correct, but still no link is detected, try with another “Beam Emitter”.

Symptom: The “Start-Split-Stop” detects the broken beam, but it

does not signal the “Base” unit

Possible reasons and suggested actions:

- If you see the 3 “Link Quality” LEDs lit for a few seconds every time you break the beam, but still you don't see the base acting upon it, try replacing the batteries in the “Start-Split-Stop”

7.3 “Base Unit”

Symptom: The “display” remains blank after switch on

Possible reasons and suggested actions:

- The batteries are drained, try replacing the batteries
- The batteries polarity is reversed, follow the drawings in the battery holder

Symptom: The “Base Unit” does not recognize a broken- beam event

Possible reasons and suggested actions:

- See *The “Start-Split-Stop” is unable to 'see' the beam from the “Beam Emitter”*

8 Frequently Asked Questions

- Question: I want to add another “Start-Split-Stop” and “Beam Emitter”, is it possible ? Do I need to give you a code or anything ?

  Answer: Yes, you can add up to 8. All the “Beam Emitter” are the same amongst them and also the “Start-Split-Stop”, so there is no need to inform us of any code or frequency, since they are all exactly the same.

- Question: My friends have a “Agility In Motion Wi-Chrono” also, can I use their “Start-Split-Stop” and “Beam Emitters” ?

  Answer: Yes, you can. The “Base Unit” is not restricted to a set of components, they are all the same and can be shared.

- Question: I have 2 sets of “Agility In Motion Wi-Chrono” but noticed that when I used them together, they get activated at the same time ?

  Answer: Yes, that is correct. If you plan to use both systems at the same time, but want to preserve their independence, we can reprogram them. Please contact us.

- Question: What is the accuracy of the system ?

  Answer: The system runs with a high precision clock with a specified accuracy of 50 PPM, (it is off, at most, by 50 'ticks' per millions), which actually depends on several physical factors, like temperature. Expect the system to run about 1/100” plus or minus per minute.

- Question: I compared my system to my friends system, we both were using the same start and stop, but the times are off by 1/100, but only sometimes ?

  Answer: The source clock is very accurate, but many factors affect the time processing, the most important one being that is “interrupt driven”. When a beam event happen, the system “gets interrupted” at a 1/100” boundary, that's why 2 systems might “look” off by 1/100.

9 Technical specifications

- FCC ID:OUR-XBEE
- “Start-Split-Stop” to “Base” Range : Up to 100m (110y) with line of sight (wireless)
- “Beam Emitter” to “Start-Split-Stop” Range: Up to 5m (IR)
- Operating Temperature : 0 to 45 degree Celsius